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CITY OF MEDICINE

CITY OF DURHAM, NORTH CAROLINA

# ANNUAL SANITARY SEWER SYSTEM REPORT FY 2016-2017

Welcome to the City's annual summary of the performance of Durham's sewer system. In addition to informing our customers about the sewer system, this report also meets the requirements of House Bill 1160 passed by the North Carolina General Assembly in 1999. The bill requires owners and/or operators of wastewater collection and treatment systems to provide an annual report to users or customers.

Each year's report summarizes the treatment works' and collection system's performance over a 12-month period. This report is available to all customers and is submitted to the North Carolina Department of Environmental Quality.

**About the Department**

All water and sewer operational units are a part of the Department of Water Management. The Water and Sewer Maintenance Division is responsible for the operations and maintenance of the collection system. Sometimes referred to as the sanitary sewer system, this is the series of pipes that transport wastewater to the treatment facilities operated by the Wastewater divisions. Wastewater includes all domestic and process water *from* any drain leaving a residence, business, industry, or other facility and entering the collection system.

Wastewater travels through underground sewer pipes to the treatment plant, where it is treated by physical, biological, and chemical processes before it is returned to the environment via receiving streams.

The City is committed to protecting the environment and the health of downstream users by ensuring that Durham's wastewater discharges meet all applicable standards. Because of this high level of treatment, water downstream of a water reclamation facility may be cleaner than the water upstream of the facility.

This report describes the collection system operation, the wastewater treatment process, and the City's grease reduction initiative. As with any large municipal system, occasional blockages cause backups and overflows. Included in this report is a table listing the spills and overflows that occurred this year and the steps taken to mitigate the impact and prevent recurrences. ALL incidents were reported to the state within 24 hours of their occurrence. By policy, news releases are distributed to the public by the end of the next business day after an occurrence.

South Durham Water Reclamation Facility. The City operates two WRFs.

The Annual Sanitary Sewer System Report is available at City Hall, Water Management and Public Works facilities, and on the City's website: www.durhamnc.gov/946. Additional copies of the report may be requested by calling Water Management at 919-560-4381.

**Down the Drain! Where Does It Go?**

When waste exits a home, business, or industry via piping, the wastewater enters the collection system. These pipes carry wastewater away from homes, businesses, schools, hospitals, and industries.

The waste flows by gravity or may flow to lift stations located in strategic areas throughout the service area. Pumps in the lift stations do just that — they "lift" the wastewater to a higher elevation where it again flows by gravity, ultimately to one of the City's two water reclamation facilities. Sixty-four pump stations for the collection system are monitored and maintained by Lift Station Maintenance division staff.

Durham sits on a ridgeline that generally runs along Pettigrew Street and the railroad tracks. Wastewater on the north side of the ridgeline flows to the North Durham Water Reclamation Facility and after treatment is ultimately discharged into the Neuse River Basin. The South Durham Water Reclamation Facility receives wastewater that flows south of the ridgeline. After processing, the discharge flows into the Cape Fear Basin.

| Durham's Sewer System Facilities | | | |
|---|---|---|---|
| | **Collection System** | **Water Reclamation Facility** | |
| **Name of Facility** | Water and Sewer Operations Center | North Durham Water Reclamation Facility | South Durham Water Reclamation Facility |
| **Permit Number** | WQCS00005 | NCOO23841 | NCOO47597 |
| **Address** | 1110 Martin Luther King Jr. Pkwy. | 1900 East Club Blvd. | 6605 Farrington Rd. |
| **Operator in Responsible Charge (ORC)** | Junior Mobley | John Dodson | Charles Cocker |
| **Phone Number** | 919-560-4344 | 919-560-4384 | 919-560-4386 |

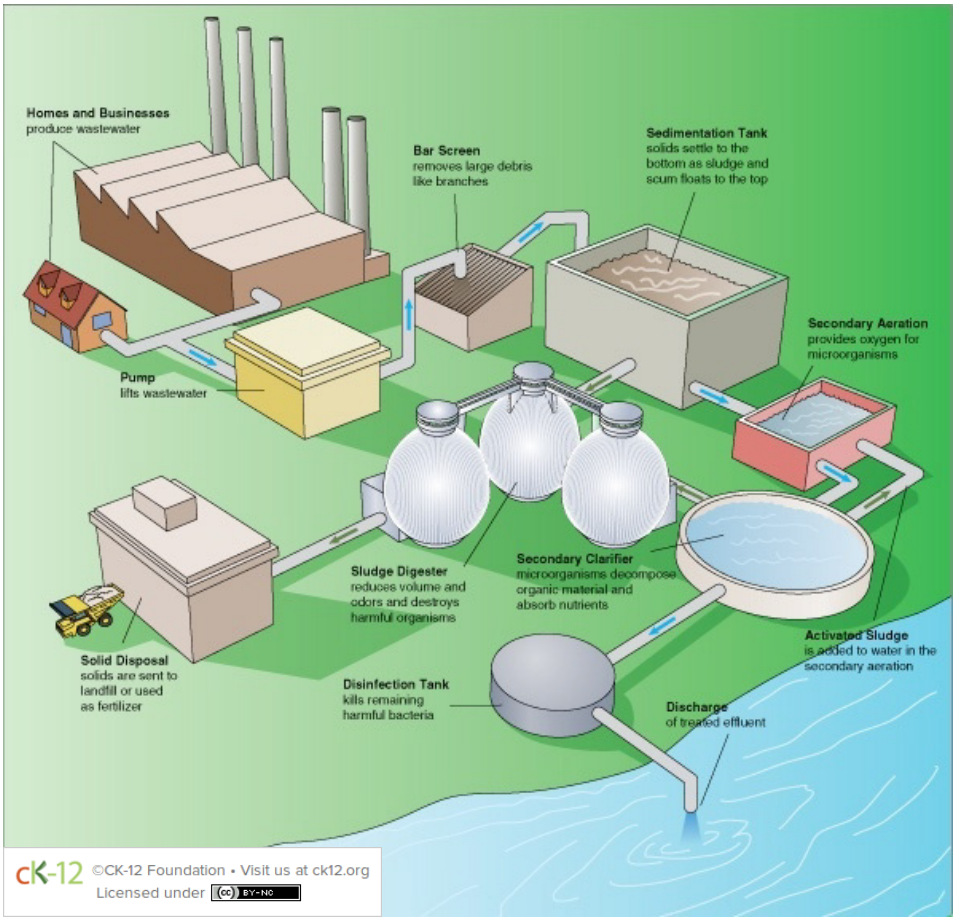
Durham County owns and operates a third wastewater treatment plant that serves most of Research Triangle Park, Parkwood, and a few other southern Durham neighborhoods. The Durham County sewer system report is posted at www.dconc.gov.

**Collection System Performance**

City departments use Geographical Information System (GIS) mapping of the collection system which provides an accurate method of tracking both operations and maintenance activities. Approximately 1,097 miles of the collection system are represented by GIS mapping.

During this reporting period, Water and Sewer Maintenance crews and City contractors conducted numerous maintenance activities to clean and rehabilitate the collection system. These maintenance activities include cleaning lateral services, flushing, camera inspection (CCTV), replacing mains, and mowing easements. Maintenance crews repaired/replaced 101 sewer services and responded to 617 blockages. Improper disposal of grease led to 37.5 percent of blockages in the sewer system (see pages 3 & 4).

City staff continues to focus resources on preventing repeat blockages and promoting a maintenance campaign to alleviate the environmental and financial impacts of this problem. One major element of the program has been an extensive cleaning of problem areas of the system. The second major element of the program is the education, prevention, and enforcement effort coordinated by the Department's Industrial Pretreatment/FOG Program. Funding of infrastructure rehabilitation is a high priority of the department's Capital Improvement Program (CIP).




**This illustration shows the typical wastewater treatment process. The City's water reclamation facilities at North and South Durham have similar layouts.**

| Maintenance Activities | |
|---|---|
| **Activity** | **Linear Feet** |
| Lateral Service | 3,168 |
| Flushing | 859,531 |
| Inspections (CCTV) | 303,177 |
| Mains Replaced | 151 |
| Easements Mowed | 1,378,819 |
| Cured-in-Place Pipe | 16 |

**Water Reclamation Facilities Performance**

The City's two wastewater treatment plants — North Durham and South Durham Water Reclamation Facilities (WRFs) — have the combined capacity to treat (or reclaim) 40 million gallons per day (MGD) of wastewater. During this reporting period, the average daily flow treated by the two plants was 18.72 MGD.

North Durham WRF treated 3.6 billion gallons, or an average of 9.78 MGD.

**Aeration basins at North Durham Water Reclamation Facility. Air is pumped into the wastewater to help microorganisms feed on organic material.**

The facility had three daily max permit violations in April 2017 as a result of heavy rains which resulted in flows exceeding 50 MGD for more than 14 hours.

With the new chemical feed facilities now online and other process improvements, total nitrogen discharge was 73,592 pounds, and phosphorus discharge was 2,442 pounds — both well under permit requirements and in compliance with Stage 1 of the Falls Lake Rules for nutrient reduction, which went into effect January 1, 2016.

Completed construction projects include upgrades and replacements of obsolete equipment and control panels. Construction of additional clarifiers and new screening facilities and other miscellaneous process improvements and upgrades is slated to begin in early 2018.

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South Durham WRF treated a total of 3.26 billion gallons, or an average of 8.94 MGD. The plant met all permit requirements during this period, although Hurricane Matthew did pose some treatment challenges on October 8, 2016.

The facility successfully decreased total nitrogen discharge by 18.3 percent from fiscal year (FY) 2016 to FY2017; additionally, total phosphorous discharge decreased by 36.4 percent in this same time period.

These decreases were made possible by the recently constructed process improvements at the facility. Construction of a new preliminary treatment facility, final clarifier, UV disinfection facility, and other improvements is expected to begin in early 2018.

**Industrial Waste Control/FOG Program**

Industrial Waste Control (IWC) staff survey facilities discharging into the sewer system and issue permits to facilities in certain categories, determined either by the type of business activity they conduct or the type(s) of wastewater discharged from their facility. Permit limits are established based on the ability of the receiving treatment plant — either the North Durham WRF or South Durham WRF — to assimilate, treat, and remove substances from the waste. Currently, staff monitors 20 industrial users and hundreds of commercial establishments with high-strength discharges.

To help in the effort to reduce grease blockages in the sewer system, the IWC staff coordinates the education and inspection portion of the grease reduction initiative.

FOG (fats, oils and grease) may enter the sewer system from either household drains or through poorly maintained grease traps in restaurants and other food service establishments.

To meet the 250 mg/L limit for FOG,

A look inside Garrett Road Lift Station, one of 64 such stations the City operates. WRFs treat approximately 18 million gallons of wastewater every day at our facilities in North & South Durham.


**Dispose of grease by pouring it directly into a Fat Trapper and placing bags in the household trash, or taking them to the City's Waste Disposal Recycling Center. Fat Trappers are available to residents at no cost.**

food preparation and/or processing facilities must clean their removal systems (grease traps) on a monthly basis. More frequent cleaning will be required if a facility discharges more than 250 mg/L of FOG. Less frequent cleaning may be permitted if the facility can demonstrate that the 250 mg/L limit can be met with an alternate cleaning schedule. Cleaning and removal records must be maintained for three years and available for inspection on request.

While restaurants and other food service establishments typically use commercial processors to collect and remove grease from their grease traps, it is not practical for homeowners and residential customers to contract such services. For this reason, the City has provided — at no extra cost to residents — a collection container for used cooking oil at the Waste Disposal and Recycling Center at 2115 East Club Boulevard.

Residents are encouraged to implement measures designed to ensure that FOG is not introduced into the sanitary sewer. To assist customers with this effort, Water Management provides small residential grease collection units called Fat Trappers. Customers can call 919-560-4386 and ask for IWC staff for more information on obtaining a complimentary Fat Trapper.

**DO**

- Collect FOG in containers and dispose of it properly.
- Remove FOG from kitchen utensils, equipment, and food prep areas with scraper/ towels/broom.
- Keep FOG out of wash water.
- Place food scraps in a waste container for solid wastes.

**DON'T**

- Pour FOG down the drain.
- Wash fryers/griddles, pots/ pans, and plates/utensils until FOG is removed.
- Use hot water to rinse FOG off of surfaces.
- Use the drain as a means to dispose of food scraps.

**Remember: the drain is not a trash can!**

**The toilet is NOT a trash can!**

Sanitary sewers are designed to handle human waste, toilet tissue, and approved industrial commercial wastes. In addition to oil and grease, nonwoven materials such as disinfectant wipes and diapers can and do cause problems. Although products may be labeled flushable, that does not mean they will easily biodegrade within the sewer system. These items can not only cause sewer overflows but can also damage the pumps and other infrastructure.

Flushing inappropriate items down the toilet invites clogs and blockages. *Do your part: throw trash items in the garbage, not down the toilet.*


Visit www.durhamsaveswater.org for more information.

**Notice Under the Americans With Disabilities Act**

The City of Durham will not discriminate against qualified individuals with disabilities on the basis of disability. Anyone who requires an auxiliary aid or service for effective communications, or assistance to participate in a City program, service, or activity, should contact the office of Stacey Poston, Acting ADA Coordinator, Voice: 919-560-4197 x21254, TTY: 919-560-4809; Stacey.Poston@durhamnc.gov, as soon as possible but no later than 48 hours before the scheduled event.

# Spills and Overflows From July 2016 to June 2017

| Location | Date | Volume Discharged (gallons) | Cause | Remedy |
|---|---|---|---|---|
| 2612 Erwin Rd. | 8/9/2016 | 81,000 | Vandalism/debris in line | Unblocked, jetted, CCTV, cleaned, dammed creek, flushed creek, pumped to collection system |
| 1007 Taylor St. | 8/27/2016 | 225 | Grease | Jetted, cleaned, dammed creek, flushed creek, pumped to collection system, CCTV |
| 1433 Geer St. | 9/19/2016 | 18,000 | Grease/debris in line | Jetted, cleaned, dammed creek, flushed creek, pumped to collection system, CCTV |
| 4501 University Dr. | 10/4/2016 | 1,300 | Grease/roots | Jetted, cleaned, dammed creek, flushed creek, pumped to collection system, CCTV |
| 5316 Newhall Rd. | 10/23/2016 | 15,000 | Roots | Jetted, removed roots, cleaned |
| Penrith Dr. | 11/28/2016 | 1,160 | Grease | Jetted, cleaned |
| 406 Mineral Springs Rd. | 12/18/2016 | 400 | Roots | Removed roots, cleaned |
| 24 Phauff Ct. | 12/28/2016 | 9,750 | Roots/debris in line | Removed roots, cleaned |
| 3000 block of Hwy 55 | 2/2/2017 | 3,000 | Debris in line | Unblocked, dammed creek, flushed creek, pumped to collection system |
| 915 Clarendon St. | 2/7/2017 | 7,800 | Pipe failure | Dammed creek, flushed creek, pumped to collection system, plugged & bypassed line, repaired |
| 3001 Cameron Blvd. | 4/4/2017 | 36,000 | Roots | Removed roots, cleaned |
| 405 East Pilot St. | 4/7/2017 | 450 | Unknown | Cleaned, flushed, dammed creek, flushed creek, pumped to collection system |
| 2300 Fitzgerald Ave. | 4/17/2017 | 2,400 | Vandalism | Unblocked, cleaned, dammed creek, flushed creek, pumped to collection system |
| 1920 Ivy Creek Blvd. | 5/7/2017 | 2,400 | Grease/debris in line | Unblocked, cleaned, dammed creek, flushed creek, pumped to collection system |

# Spills and Overflows From July 2016 to June 2017 (continued)

| | | | | |
|---|---|---|---|---|
| 918 Grant St. | 6/1/2017 | 1,800 | Grease | Unblocked, dammed creek, flushed creek, pumped to collection system |
| 3014 Sparger Rd. | 6/20/2017 | 750 | Infiltration/inflow | Waited for storm event to subside, cleaned solids around wet well |